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Supply Chain Integration and speed of new products introduction: An analysis based on the Absorptive Capacity mediation

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SUPPLY CHAIN INTEGRATION AND SPEED OF NEW PRODUCTS INTRODUCTION: AN ANALYSIS BASED ON THE ABSORPTIVE CAPACITY MEDIATION.

Abstract

This article sought to verify the direct and indirect influence of supply chain integration (SCI) on speed of new products introduction (NPI). We tested the indirect influence of the SCI on NPI using the company absorptive capacity as mediating variable. To do this, we used an online questionnaire encompassing dimensions upon supplier and customer integration into new product development, absorptive capacity and speed of new products introduction. We applied this questionnaire to 82 companies located in the South of Brazil and that belonging to the textile industry. We used the Structural Equation Modeling to test the relationships proposed above. As a result, we found out the neither suppliers, nor customers have direct influence on the speed of new products introduction, but this relationship happens via the manufacturer's absorptive capacity. Thus, we suggest that, in the textile industry, the integration with partners by itself does not impact on the operational performance once it depends upon the internal resources of the manufacturer to acquire, assimilate and explore the knowledge to commercial ends.

Keywords: supplier integration; customer integration; absorptive capacity, speed of new products introduction

1 Introduction

Market orientation has been the focus of many organizational strategies and has been considered as a source of competitive advantage (Filippini, Salmaso & Tessarolo, 2004; Koufteros, Vonderembse & Jayaram, 2005). High competition and several changes on customer preferences have been blamed for that organizational choice since they force the manufacturers to work as fast innovators and act proactively at the marketplace (Powell & Grodal, 2005).

This context seems to be more strained in industries with higher levels of technological changes, wherein the shrinking of a product launch interval (high clockspeed) and the decrease of product life time lead the manufacturers to accelerate their production process (Fine, 2000). Thus, being a fast innovator benefits the manufacturer by keeping its competitiveness and survival at the marketplace, responding rapidly to the market changes and offering products that are suited to the customer's needs (Lambert & Slater, 1999; Rothwell, 1994).

This scenario instigates the manufacturer to decrease the time-to-market (Filippini et al., 2004; Griffin, 1993; Prašnikar & Škerlj, 2006) and to offer products with quality, flexibility, cost efficience and delivery (Feng, Sun & Zhang, 2010; Handfield, Ragatz, Petersen & Monczka, 1999; Hongyi, Keung & Ming, 2010; Koufteros, Vonderembse & Doll, 2001). In spite of those indexes reflect the manufacturing performance (Ferdows & De Meyer, 1990), a success product also demands customer acceptance, customer satisfaction, increased sales and return on investments (Souder, Buisson & Garrett, 1997).

Based on these considerations, internal cross-functioning, as manufacturing, design and marketing teams working jointly, was recognized as a tool to optimize the internal process to match market needs with operational capacity (Calantone, Droge & Vickery, 2002; Pinto, Pinto & Prescott, 1993; Song & Swink, 2009; Swink & Song, 2007). However, firms have recognized their limitation to reach out such performance due to the environmental turbulence and scarcity of internal resources to perform the activities (Petersen, Handfield & Ragatz, 2003; Souder, Sherman & Davies-Cooper, 1998; Van de Ven, 1976b). This scenario awoke the sense of external dependence and led the manufacturers to integrate customers and suppliers (supply chain integration) into new product development to get the needed resources to outperform (Das, Narasimhan & Talluri, 2006; Koufteros et al., 2005).

Although Supply Chain Integration (SCI) has been recognized as a way to update the internal knowledge, some studies have not found a direct influence of SCI on new product introduction, what means that it must have something mediating this kind of influence (Bajaj et al., 2004). In this article we claim that the integration with partners by itself is not enough to increase the speed of new products introduction, once it depends of the company capacity to recognize the value of the information that is outside its borders, acquire, assimilate and exploit it to commercial ends. Thus we understand that the company absorptive capacity may mediate the relationship between supply chain integration and the speed of new products introduction.

Therefore, this study aims to find out what it is the direct and indirect influence of SCI on speed of new product introduction when mediated by the company absorptive capacity. In order to do so, we perform this study in companies of textile industry located in the South of Brazil once the clock speed of this companies tend to be high and the speed of new products introduction must be fast.

2 Literature Review

This section is related to the clarification of the subjects that are explored in this study. Thus, over this section is discussed the concepts, operationalization and results of previous researches upon both Supplier and customer integration and organizational absorptive capacity.

2.1 Supplier Involvement in New Product Development (NPD)

Supplier Involvement is a topic that has got the attention of scholars over the past several years (Lockström, Schadel, Harrison, Moser & Malhotra, 2010). The research evolution about this topic started in the mid-eighties after evidence of superior performance in the automobile industry in Asian manufactures over the Western ones, mainly when it comes to product development cycle time, engineering expenses and product quality (Bidault, Despres & Butler, 1998).

The results of the supplier integration are realized in the short and long-term through the cost reduction, increased productivity, product quality improvements, adherence to product cost targets, adherence to development budgets, adherence to development schedules, increased speed of new product development, innovation capacity, radical innovation and time-to-market (Afuah, 2000; Bonaccorsi & Lipparini, 1994; Clark, 1989; Cousins & Lawson, 2007; Gupta & Souder, 1998; Hoegl & Wagner, 2005; Perols, Zimmermann & Kortmann, 2013; Primo & Amundson, 2002; Ragatz et al., 1997; Song & Di Benedetto, 2008; Swink, 1999).

In general, those outcomes, symbolize improvements on operational, marketing and business' performance (Cousins & Lawson, 2007; Primo & Amundson, 2002; Ragatz et al., 1997; Wasti & Liker, 1997), are taken as yielding results of the supplier's experience and information about the components and alternative technologies to develop the new product (Ragatz et al., 1997).

Supplier involvement into new product development is highly correlated to the information exchange and anticipation of new technologies that in turn, improve the operational performance and increase the speed of new products introduction at the market (Liker et al., 1996).

2.2 Customer Involvement in New Product Development (NPD)

Customer involvement has been updated from passive audience to active players (Prahalad & Ramaswamy, 2000), listening and integrating customers have been recognized by scholars as potential source of competitive advantage (Campbell & Cooper, 1999; Feng et al., 2010), successful strategy (Brockhoff, 2003) and a best practice in NPD (Dooley, Subra & Anderson, 2002; Enkel, Kausch & Gassmann, 2005).

Customer involvement has several overlapping definitions and it may be found under diverse typologies in literature. In a broader sense customer involvement refers to the mediation between customer and the product design process (Kaulio, 1998). More specifically, it is defined as a formalized relationship between a customer and a manufacturer, including the performance of coordinated activities to develop a new product (Campbell & Cooper, 1999) or yet the extent that customers participate into a supplier's NPD from the ideation to prototype testing stage (Eisenhardt & Tabrizi, 1995).

Manufacturers which integrate customers into NPD are concerned about the in-house lack of information to act proactively on the marketplace (Li & Calantone, 1998). Customer

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involvement updates the manufacturer's information to design a product that satisfies the customers' needs and minimize the environmental uncertainties (Calvert, 2003; Gales & Mansour-Cole, 1995; Mason-Jones & Towill, 1997; Powell et al., 1996).

Thus, a market-orientation relationship enhances the accuracy of demand information, reduces the manufacturer's uncertainty caused by the environmental turbulence (Gales & Mansour-Cole, 1995; Hung & Chou, 2013; Jaworski & Kohli, 1993), enables a faster and more efficient reaction to market changes, promotes innovation (Sandmeier et al., 2010), impacts on production planning's time reduction (Rothwell, 1994), product quality (Hongyi et al., 2010; Lengnick-Hall, 1996), delivery reliability and process flexibility (Feng et al., 2010), decrease the time-to-market (Feng, Sun, Zhu & Sohal, 2012; Filippini et al., 2004) and consequently impacts on cost reduction, responsiveness of demand changes and customer satisfaction (Flynn et al., 2010; Zhao et al., 2013). Therefore, customer involvement has a significant positive influence on NPD performance, mainly when it comes to marketing and manufacturing performance (Chien & Chen, 2010).

2.3 Absorptive Capacity

Absorptive Capacity is a theory from both Strategic Management and Organizational Behavioral field that was begun through Cohen and Levinthal' study in 1990, taking in account researches from a Psychology field related to cognitive structures for learning and the ways that it happens.

At organizational level, the Absorptive Capacity presumption emerges from the ability of the firm to acquire new knowledge that, in somewhat, is related to a prior existing one. Prior knowledge works as facilitator to absorb and assimilate new information, since part of acquired knowledge is similar to the existing one and part is completely new (Cohen & Levinthal, 1990; Kogut & Zander, 1992).

Even with some disagreements or critiques between authors which strove to reconceptualize or rejuvenate the Absorptive Capacity's concept, most of them agree that the stages that leads the company to upper performance is not far from what was suggested by Cohen & Levinthal (1990). Thus, the Absorptive Capacity's first stage, the knowledge acquisition, is related to the firm's competence to recognize and obtain outside of its boundaries, from external linkages derived from its Social Capital, the needed knowledge that match with its expectations. It is also a function of the speed and intensity of firm's struggle to gather the demanded knowledge and take the company to the competitive advantage, in which the faster and deeper is the firm's struggle to get the new knowledge, the greater is the quality of competences that will aid in the building of the Absorptive Capacity (Yli-Renko, Autio & Sapienza, 2001; Zahra & George, 2002).

After the knowledge acquisition's stage, comes the stage that is represented by the company's ability to process, interpret and analyze the new acquired knowledge based on prior-related knowledge. The assimilation of new knowledge leads the company to update its cognitive structure to understand new contexts and decide the best strategy and skills to deal with them (Todorova & Durisin, 2007; Zahra & George, 2002).

Last, the exploitation stage refers both to the application of knowledge and the adapted routines to obtain competitive advantage at market or to approach the new opportunities. In other words, the exploitation stage is related to the use of both existing and new knowledge for commercial ends (Cohen & Levinthal, 1990; Kogut & Zander, 1992; Zahra & George, 2002). The exploitation stage may also be associated with the company's innovative process since the acquired knowledge serves as a platform that enables the company to innovate and satisfy the market requirements (Van den Bosch et al., 1999).

2.3 Ripple influence of Supply Chain on product performance via Absorptive Capacity

Potential benefits from supply chain relationship are optimized when the partners are financially attractive and when the manufacturer controls the degree of integration with partners. Financially-attractive partners are more willing to invest on shared structures, share information, developing trust and commitment that potentiate the gains from the relationship (Gruner & Homburg, 2000).

Conversely, manufacturers must control the supply chain integration due to the delay in the design of new products promoted by the excess of information exchange between partners (Bajaj et al., 2004). This statement confirms the Villena, Revilla & Choi (2011)'s approach, which considers that too much and too little interaction with partners awakes the dark-side of the relationship that hurts the performance (Villena et al., 2011).

Under these considerations, customer and supplier involvement into NPD seems to be a very complex relationship due to the set of variables that must be managed and that affect the progress of the relationship and the expected results. Thus, putting in touch the scholars's findings which were mentioned previously, we claim that integrating customers and suppliers in NPD's stages sounds like a good strategy to reduce the environmental uncertainties (Gales & Mansour-Cole, 1995) and to enhance the NPD' success when it comes to marketing and manufacturing performance (Feng et al., 2010). Results from the relationship might be even better when the partners are committed in all NPD's process Eason (Kaulio, 1998).

Although integrating partners in all NPD' stages are desirable, performing activities that are market-driven offers risks that might hurt the performance, especially regard to speed of new products introduction (Kaulio, 1998). Hence, manufacturers must perform those activities controlling the level of partners' interaction (Villena, Revilla & Choi, 2011), balancing its negative direct influence in some NPD' stages with its positive ripple influence on others (Bajaj et al., 2004).

Understanding the Absorptive Capacity as a source of knowledge, the close relationship with consumers (Szulanski, 1996; von Hippel, 1978), buyers, suppliers (Dyer & Singh, 1998; Petersen, Handfield & Ragatz, 2005a; Szulanski, 1996), partners in strategic alliance (Hult, Ketchen & Arrfelt, 2007; Mowery et al., 1996; Vasudeva & Anand, 2011) and clusters (Valdaliso et al., 2011), have been considered essential for the companies' awareness about the capabilities that others possess and, in turn, for the discovery of the specific knowledge that will support the activities for a new exploitation or potential innovation.

Based on these considerations, the benefits as accruing from the involvement of suppliers and customers into NPD process are not due to the relationship by itself, but due to the company capacity to control the knowledge acquisition that is outside its borders (suppliers and customers), learn this knowledge and translates it to a language that every employee may understand and then, exploit it to commercial ends. This process generates benefits to the operational performance like the increase of the speed of new products introduction.

3 Methods

This research is classified as descriptive and causal. Descriptive because it describes the relationships between supply chain integration (SCI) and the speed of new product's introduction and, causal because we understand that SCI may affect, somehow, the companies' operational performance.

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For this, we used a quantitative method, by applying a survey to textile industry companies placed in the South of Brazil. From this survey we get information from 82 companies.

The companies were invited to answer an online questionnaire encompassing questions related to both supplier and customer integration in NPD process, to the steps of the absorptive capacity and to operational performance, mainly when it refers to speed of new products introduction. The questionnaire had answers scaled in 5 points, ranging from 1 - Totally Disagree to 5 – Totally Agree.

The supplier integration's questions were based on Chen, Injazz & Paulraj (2004); customer integration on Koufteros, Vonderembse & Jayaram (2005); absorptive capacity on Cohen & Levinthal (1990) and speed of new product introduction on Swink, Talluri & Pandejpong (2006).

Thus, based on the literature review and in line with the questionnaires, we formulate the structural model depicted in the Figure 1 to be tested.

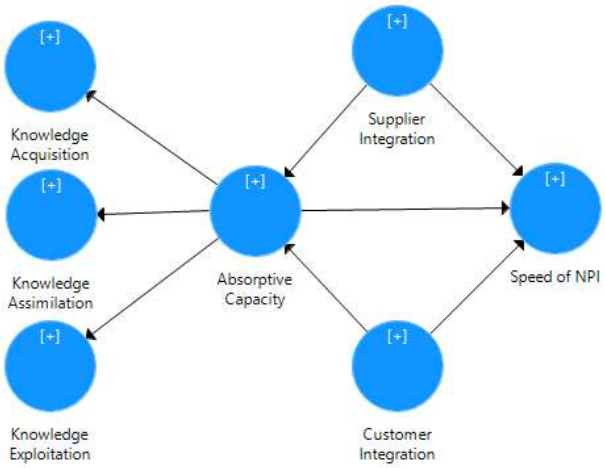

Figure 1: Structural Model
Source: research data

In this structural model we did not create any hypothesis because we found support the direct and indirect effects of supply chain integration on the speed of new products introduction, however, these supports are not based on textile industry like the focus of this study. Thus, we prefer to test the relationships, without specifying hypothesis, once this kind of relationship in this type of industry is set up as exploratory.

The data was imported to the software Statistical Package for Social Sciences (SPSS) to perform the descriptive analysis and then to SmartPLS software to test the structural model. By using the SmartPLS software it was possible to test the structural model via Structural Equation Modeling in a small sample.

To get started we perform the data refining, eliminating questions that presented factorial loads below 0,70 and significance higher than 0,05). After this procedure, we calculated the Cronbach Alfa and Composite Reliability of the dimensions, which must be higher than 0,70 to certificate internal consistence. We also calculated the Average Variance Extracted (AVE) that must be higher than 0,5 to get internal consistence as well.

After that we verified if the dimensions are different among them to avoid problems of collinearity. For this we run a correlation matrix and the root of the AVE. The root of the AVE must be higher than the correlations to certificate the discriminant validity.

For last, we analyzed the existence of relationships between the constructs by the observation of the regression weights as their significance (p-value below 0,05).

4 Results

To get started the data analysis we proceed with some descriptive statistics in order to verify the central trendy and the normality of the data. Thus, the descriptive statistics includes the mean, median, standard deviation, kurtosis and skewness. This analysis is depicted in the Table 1.

Table 1: Descriptive Analysis

Dimensions	Items	Mean	Median	Stand. Deviation	Skewness	Kurtosys
Supplier Integration	SUPPLIER01	3,74	4,00	1,275	-1,005	,029
	SUPPLIER02	3,10	4,00	1,420	-,362	-1,364
	SUPPLIER03	3,12	4,00	1,364	-,375	-1,199
	SUPPLIER04	3,60	4,00	1,265	-,656	-,742
	SUPPLIER05	2,27	2,00	1,306	,439	-1,244
	SUPPLIER06	3,07	3,00	1,404	-,215	-1,262
Customer Integration	CLIENTE01	4,65	5,00	,807	-2,020	5,078
	CLIENTE02	4,33	5,00	1,066	-1,888	3,079
	CLIENTE03	4,56	5,00	,848	-2,253	5,057
	CLIENTE04	4,01	4,00	1,212	-1,133	,328
Knowledge Acquisition	AQUISI1	3,84	4,00	1,083	-,753	,009
	AQUISI2	4,15	4,00	,983	-1,261	1,406
	AQUISI3	4,24	5,00	1,061	-1,526	1,797
	AQUISI4	3,91	4,00	1,021	-1,039	,896
	AQUISI5	3,95	4,00	1,088	-,846	-,094
Knowledge Assimilation	ASSIMIL1	3,02	3,00	1,176	-,002	-,918
	ASSIMIL2	3,54	4,00	1,209	-,539	-,748
	ASSIMIL3	3,07	3,00	1,225	-,225	-,944
	ASSIMIL4	3,29	3,00	1,291	-,392	-,845
	ASSIMIL5	3,22	3,00	1,257	-,199	-,932
Knowledge Exploration	EXPLOR1	4,01	4,00	1,036	-1,185	1,405
	EXPLOR2	4,40	5,00	,873	-1,691	2,929
	EXPLOR3	4,33	5,00	,917	-1,694	3,197
	EXPLOR4	4,34	5,00	,933	-1,864	4,071
	EXPLOR5	4,39	5,00	,940	-2,053	4,644
Speed of NPI	OPERAC5	3,73	4,00	1,112	-,772	-,012

Source: research data.

According to the items of the dimension Supplier Integration, all the items, with exception of the SUPPLIER05, present mean above 3, which means that somehow Suppliers are involved in the process of new product development (NPD)? Thus, companies have recognized the importance of having the suppliers not only as a provider of raw material, but also as a partner that may influence in the NPD project and responsible by both success and

failure's products. The item SUPPLIER5 is related to the Supplier participation in the definition of companies' strategy. This statement is not in line with the position that suppliers possess in the companies' routines once the mean has pointed out that there is a disagreement on it. Based on this, we suggest that the supplier participation on NPD process is a strategic decision, even when it is not consulted about that.

In terms of customer integration, it seems that this kind of involvement is more common among the companies once the mean of the items is all above 4. This involvement includes visiting the customers, listen to their ideas and attend their needs through the development of new products. If compared with supplier integration, customer integration seems to be more noticeable in this industry. In general, customer integration has been seen as the best channel to gather information from the market and to translate it to a product that attends the end consumer's needs (Gemünden et al., 1992).

When it comes to Absorptive Capacity, the knowledge **acquisition** is more about the competitor's strategy and the products that are available in the market. The search for information via suppliers and customers it is not common among the companies.

The **assimilation** process, that is the process of learning the new knowledge, is more noticeable in meetings to discuss the knowledge that was gathered from the market, in promoting courses to qualify the employees about how to use new technologies and how to develop new products. It's not perceived among companies the information sharing about suppliers, customers and market with all employees, which means that this knowledge is usually constrained to the NPD team. In terms of **exploiting** the knowledge for commercial ends, companies have declared that the information that is gathered from suppliers, customers, market and competitors help them to improve their strategic planning and get some advantages in the market.

For last, companies have agreed partially that because of the supplier and customer integration and also their capacity of acquiring, assimilating and exploiting the knowledge, they have put their products in the market before their competitors.

Through this analysis was also possible to verify the normality of the data, which are according to the literature recommendation, enabling the data for multivariate analysis. Thus we proceed to the dimensions refining, that is about the exclusion of items that are not well fit in the dimension that they belong to. The results of the data refining are presented in the Table 2.

Table 2: Unidimensionality of the dimensions

Dimensions	Items	Loads	Signif	Cronbach's Alfa	Composite Reliability	AVE
Acquisition	AQUISI1	0,816	0,000	0,868	0,905	0,656
	AQUISI2	0,809	0,000			
	AQUISI3	0,888	0,000			
	AQUISI4	0,755	0,000			
	AQUISI5	0,776	0,000			
Assimilation	ASSIMIL1	0,850	0,000	0,898	0,925	0,712
	ASSIMIL2	0,813	0,000			
	ASSIMIL3	0,867	0,000			
	ASSIMIL4	0,817	0,000			
	ASSIMIL5	0,869	0,000			
Exploration	EXPLOR1	0,825	0,000	0,841	0,913	0,678

	EXPLOR2	0,795	0,000			
	EXPLOR3	0,843	0,000			
	EXPLOR4	0,834	0,000			
	EXPLOR5	0,818	0,000			
Supplier	SUPPLIER1	0,735	0,000	0,852	0,891	0,578
	SUPPLIER2	0,862	0,000			
	SUPPLIER3	0,785	0,000			
	SUPPLIER4	0,809	0,000			
	SUPPLIER5	0,705	0,000			
	SUPPLIER6	0,702	0,000			
Customer	CUSTOM1	0,779	0,000	0,841	0,892	0,675
	CUSTOM2	0,827	0,000			
	CUSTOM3	0,792	0,000			
	CUSTOM4	0,883	0,000			
Speed	SPEED1	1,000	0,000	-	-	-

Source: research data

The analysis of the factorial loads reflects that all items possesses coefficients that are in tune with the specified in the literature. Thus, all items are significant, have factorial loads above 0,7 no item was excluded of the dimensions. To be sure of that information, we also calculated the Cronbach Alfa, the Composite Reliability and the Average Variance Extracted (EVA). Through these analyses we suggest that the dimension has internal consistence once the coefficients of Cronbach Alfa and Composite Reliability are above 0,7 and the AVE is above 0,5.

In order to verify if all latent variables are different among them, we run the discriminant validity, using the correlation among dimensions and also the root of the AVE. The results of discriminant validity are depicted in the Table 3.

Table 3: Discriminant Validity

	Knowledge Acquisition	Knowledge Assimilation	Knowledge Exploration	Supplier Integration	Customer Integration
Knowledge Acquisition	**0,810**				
Knowledge Assimilation	0,608	**0,844**			
Knowledge Exploration	0,719	0,655	**0,823**		
Supplier Integration	0,420	0,443	0,358	**0,760**	
Customer Integration	0,412	0,430	0,479	0,447	**0,821**
Speed of NPD	0,591	0,467	0,463	0,373	0,254

Source: research data

According to the Table 3, the root of the AVE (diagonal) is higher than the correlation with all others dimensions, which means that all dimensions are significantly different from each other's. This procedure is necessary in predictive models to avoid the misrepresentation of constructs by using dimensions that look like the same.

Once the conditions to perform the multivariate analyses were satisfied, we proceed to test the structural model according the Figure 1. We run the structural model by Partial Least Squared path modeling, using the statistical software SmartPLS. The results are depicted in the Figure 2.

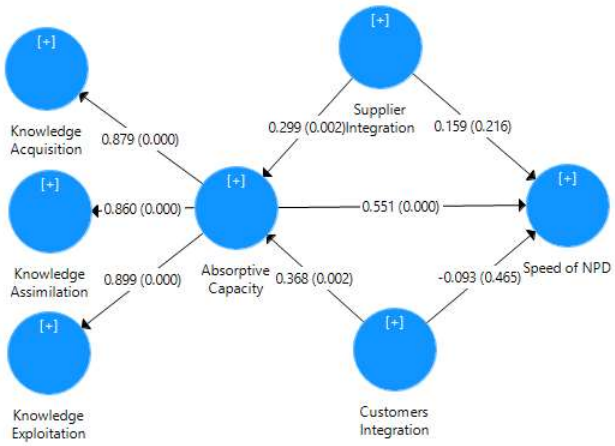

Figure 2: Structural Model Test
Source: research data

In line with the Figure 2, Supplier integration in NPD process has an influence of 0,159 on Speed of NPD, but this relation is not significant once the significance coefficient is higher than 0,05. This result is different from previous studies wherein the supplier integration had direct influence on operational performance, especially when it comes to be the first of introducing new product in the market (Cousins & Lawson, 2007; Hoegl & Wagner, 2005; Perols, Zimmermann & Kortmann, 2013; Primo & Amundson, 2002).

Supplier integration also influence in 0,299 on Absorptive Capacity, however this influence is significant at level of 99,8%. This results means the Supplier Integration in NPD process aids the company in acquiring, learning and exploiting new knowledge that may be used to formulate the strategic planning or to offer some alternative components and technologies that are valuable to the NPD process (Liker et al., 1996; Ragatz et al., 1997).

Although supplier integration does not exert a direct influence on Speed of NPD, it does exert a ripple influence on it, once it influences on the absorptive capacity that in turn, influences on the speed of NPD. We verified in the Figure 2 that intensity of this indirect effect is about 16%, which means that the variance of one unity in supplier integration influences in 0,16 (0,299 x 0,551) on Speed of NPD. This result is in agreement with previous studies that state that Absorptive Capacity is a way of gathering valuable information from external partners that can be converted into benefits that will increase the company competitiveness (Dyer & Singh, 1998; Petersen, Handfield & Ragatz, 2005a).

In terms of Customers integration to speed the NPD, we verified that there is no difference from supplier integration, once the probability of this relationship does not exist is high (sig 0,465). We suggest that the amount of information that is considered in the customer integration may delay the product project and also lower the operational performance (Bajaj et al., 2004). But also, like in Supplier integration, customer integration exerts influence on absorptive capacity (0,368; sig 0,002), that in turn, influences on the Speed of NPD. Thus, customer integration influences indirectly the Speed of NPD in 0,20 (0,368 x 0,551). It supports the studies of Bajaj and colleagues (2004). Because the influence of Supply Chain integration on speed of new products introduction is not perceived in this sample, we suggest that the absorptive capacity of the manufacturer mediates this influence.

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In spite of need of integrate partners to have benefits and reach out better results, it's noticed that the relationship by itself does not bring upper performance, but it depends on the company capacity to recognize and absorb the knowledge that is in the external environmental. A possible explanation about this phenomenon lays on the type of industry wherein this study was run.

In textile industry, the manufacturer is the responsible to create the innovation and push it to the market, once most of work in research about trendies is usually made internally. Thus, suppliers and customers are not perceived as partners in the business, since they don't participate in the definition of company's strategic planning. External partners are seen as providers of information, raw material and alternative technologies that may help in the product ideation, design and production.

In our analyses we did not realize that the level of integration with partners decrease the operational performance as verified in Villena, Revilla & Choi (2011), which means that the relationship among suppliers, customers and the manufacturer is not too much and not too little. Based on these statements we reinforce the analysis by saying that in our sample, suppliers and customers do not affect positively the speed of new products development, but they do not damage the operational performance as well.

Through the analyses performed we verified that the company's internal competences seem to be essential when integrating partners. This is because companies must have an ascertained system to recognize the information that may be valuable in the NPD process and shift the chances of meeting the market needs. In addition, the process of internal learning must be constant once the employees should be aware about the changes in the market and what is supposed to be done to minimize the environmental uncertainties. To complete the set of internal competences, companies must also apply what was learned to commercial ends in order to get competitive advantage from it.

Thus, our study is in agreement with the statements provided by Bajaj and colleagues (2004) when they claim that manufacturers must balance the involvement with external partners in order to avoid the negative direct influences on operational performance and take advantage of the indirect ones.

5 Final Considerations

This study sought to verify the direct and indirect influences of supply chain partners on operational performance when it comes to speed of new products introduction. Thus, it was performed with 82 companies belonging to textile industry in the South of Brazil.

In general, the results pointed out that external partners, as suppliers and customers, do not have direct influence on the speed of new products introduction since they are treated as providers of information, raw material and alternative technologies. It means that suppliers and customers are not considered in the formulation of the strategic planning and are not partners in the business.

Although those partners have not influenced positively on speed of new product introduction, they also did not do it negatively. Thus, the integration with external partners has not any effect on the speed of new products introduction.

In spite that, external partners do have influence on the company absorptive capacity since the information gathered from them is considered to minimize the environmental uncertainty and produce a good that satisfies the market needs. Based on this statement, we claim that suppliers and customers have an indirect effect on speed of new product introduction.

Our study supports some previous one, but don´t counteracts others. Due to the existing studies are focused on industries such as automobile, electronics, machinery and transport equipment. This study was performed in textile industries which possess some peculiarities if compared with other ones.

One of them is about the responsibility of innovate and generate products. While in automobile industries the customer (retailer) and the supplier have a deep participation in the product development, since the conception until the commercialization, in the textile industry customers and suppliers are providers of resources to develop new products. It does not mean that they have weak relationship, but it means that the involvement between partners is not enough to upper performance. In industries like textile once, the company absorptive capacity must count for most of the results in operational performance.

In terms of academic contributions, we seek to cover a gap about supply chain integration and operational performance in textile industry, since the existing studies are based on industries mentioned previously. Thus, we understand the results provided by the studies must be taken carefully, once they are applied to some industries but not for others. In managerial terms, manufactures may take advantage of this study by investing on R&D, training, workshops, that symbolize that ways of get information and learn it, when integrating partners in new product development.

The limitation of this study lay on the fact that the speed of new product introduction was measured based on the managers' perception. In spite of Likert scale is a way of quantify something subjective, it still presents some kind of subjectivity. For last, we suggest further studies considering moderating factors comparing industries of high and low technologies and the high and low ratio of innovation as well.

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